

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Use as many sheets as necessary)

Complete if Known

Application Number	10/789,042
Filing Date	February 27, 2004
First Named Inventor	Ahn, Kie
Group Art Unit	2815
Examiner Name	Landau, Matthew

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Attorney Docket No: 1303.050US2

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
	US-20070007560A1	01/11/2007	Forbes, L., et al.	06/01/2006
	US-20070007635A1	01/11/2007	Forbes, L., et al.	08/31/2005
	US-20070010060A1	01/11/2007	Forbes, L., et al.	07/07/2005
	US-20070010061A1	01/11/2007	Forbes, L., et al.	06/01/2006
	US-20070045676A1	03/01/2007	Forbes, Leonard, et al.	06/13/2006
	US-20070045752A1	03/01/2007	Forbes, L., et al.	06/13/2006
	US-20070049023A1	03/01/2007	Ahn, Kie Y., et al.	08/29/2005
	US-20070131169A1	06/14/2007	Ahn, K. Y.	01/09/2007
	US-20070134931A1	06/14/2007	Ahn, K. Y., et al.	12/08/2005
	US-20070134942A1	06/14/2007	Ahn, K. Y., et al.	12/08/2005
	US-20070158765A1	07/12/2007	Ahn, K. Y., et al.	01/10/2006
	US-20070178643A1	08/02/2007	Forbes, L., et al.	08/31/2005
	US-20070181931A1	08/09/2007	Ahn, K. Y., et al.	04/13/2007
	US-20070181772A1	08/16/2007	Ahn, K. Y., et al.	04/19/2007
	US-20070187831A1	08/16/2007	Ahn, K. Y., et al.	02/16/2006
	US-20070234949A1	10/11/2007	Ahn, K. Y., et al.	04/07/2006
	US-5,923,056	07/13/1999	Lee, Woo-Hyeong, et al.	03/12/1998
	US-7,068,544	06/27/2006	Forbes, L., et al.	08/30/2001
	US-7,195,999	03/27/2007	Forbes, L., et al.	07/07/2005
	US-7,211,492	05/01/2007	Forbes, L., et al.	08/31/2005
	US-7,214,994	05/08/2007	Forbes, L., et al.	06/13/2006
	US-7,221,017	05/22/2007	Forbes, L., et al.	07/08/2002
	US-7,221,586	05/22/2007	Forbes, L., et al.	07/08/2002
	US-7,235,501	06/26/2007	Ahn, K. Y., et al.	12/13/2004
	US-7,235,854	06/26/2007	Ahn, K. Y., et al.	02/27/2004
	US-7,259,434	08/21/2007	Ahn, K. Y., et al.	08/31/2004

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	T ²
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OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		AALTONEN, TITTA, et al., "Atomic Layer Deposition of Ruthenium Thin Films from Ru(thd)3 and Oxygen", Chemical Vapor Deposition, 10(4), (September 2004), 215-219	
		AALTONEN, TITTA, et al., "Ruthenium Thin Films Grown by Atomic Layer Deposition", Chemical Vapor Deposition, 9(1), (January 2003), 45-49	

EXAMINER

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		AHN, et al., "ALD OF Zr-SUBSTITUTED BaTiO ₃ FILMS AS GATE DIELECTRICS", U.S. Application No. 11/498,559, filed August 3, 2006	
		AHN, K.Y., "ATOMIC LAYER DEPOSITED BARIUM STRONTIUM TITANIUM OXIDE FILMS", U.S. Application No. 11/510,803, filed August 26, 2006	
		AHN, KIE Y., "ATOMIC LAYER DEPOSITION OF GDSCO ₃ FILMS AS GATE DIELECTRICS", U.S. Application Serial No. 11/215,507, filed August 30, 2005	
		AHN, KIE Y., "COBALT TITANIUM OXIDE DIELECTRIC FILMS", U.S. Application Serial No. 11/216,958, filed August 31, 2005	
		AHN, KIE Y., et al., "HAFNIUM LANTHANIDE OXYNITRIDE FILMS", U.S. Appln. Serial No. 11/515,143, filed August 31, 2006	
		AHN, KIE Y., "MAGNESIUM-DOPED ZINC OXIDE STRUCTURES AND METHODS", U.S. Patent Application Serial No. 11/706,820, filed February 13, 2007	
		AHN, KIE Y., "METHOD OF FORMING LUTETIUM AND LANTHANUM DIELECTRIC STRUCTURES", U.S. Application No. 11/823,727, filed Jun 28, 2007	
		AHN, KIE Y., et al., "METHODS TO FORM DIELECTRIC STRUCTURES IN SEMICONDUCTOR DEVICES AND RESULTING DEVICES", U.S. Patent Application Serial Number 11/581,675, filed August 16, 2006	
		AHN, KIE Y., "MOLYBDENUM-DOPED INDIUM OXIDE STRUCTURES AND METHODS", U.S. Application Serial No. 11/706,944, filed Feb. 13, 2007	
		AHN, KIE Y., et al., "TUNGSTEN-DOPED INDIUM OXIDE STRUCTURES AND METHODS", US Patent Application Serial No 11/706,498, filed February 13, 2007	
		AHN, KIE Y., et al., "ZIRCONIUM-DOPED ZINC OXIDE STRUCTURES AND METHODS", U.S. Application Serial No 11/707,173 filed 02/13/2007	
		ALERS, G. B., et al., "Intermixing at the tantalum oxide/silicon interface in gate dielectric structures", Applied Physics Letters, 73(11), (September 14, 1998), 1517-1519	
		ATANASSOVA, E., et al., "Breakdown Fields and Conduction Mechanisms in thin Ta ₂ O ₅ Layers on Si for high density DRAMs", Microelectronics Reliability, 42, (2002), 157-173	
		DIMOULAS, A., et al., "Structural and electrical quality of the high-k dielectric Y ₂ O ₃ on Si (001): Dependence on growth parameters", Journal of Applied Physics, 92(1), (July 1, 2002), 426-431	
		FORBES, "HAFNIUM ALUMINIUM OXYNITRIDE HIGH-K DIELECTRIC AND METAL GATES", U.S. Appln. Serial No. 11/514,558, filed August 31, 2006	
		FORBES, "HAFNIUM TANTALUM OXYNITRIDE HIGH-K DIELECTRIC AND METAL GATES", U.S. Appln. Serial No. 11/515,114, filed August 31, 2005	
		FORBES, LEONARD, et al., "SILICON LANTHANIDE OXYNITRIDE FILMS", U.S. Appln. Serial No. 11/514,533, filed August 31, 2006	

EXAMINER

DATE CONSIDERED

Substitute Disclosure Statement Form (PTO-1449)

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		FORBES, et al., "TANTALUM ALUMINUM OXYNITRIDE HIGH-K DIELECTRIC AND METAL GATES", U.S. Appln. Serial No. 11/514,655, filed August 31, 2006	
		FORBES, LEONARD, et al., "TANTALUM SILICON OXYNITRIDE HIGH-K DIELECTRICS AND METAL GATES", U.S. Appln. Serial No. 11/514,601, filed August 31, 2006	
		GORDON, ROY G., "New Precursors for Atomic Layer Deposition (ALD) of Metals and Diffusion Barriers", American Vac. Soc. Conference, San Jose, CA, (Aug. 4, 2003), 42 pages	
		GUHA, S., et al., "High temperature stability of Al ₂ O ₃ dielectrics on Si: Interfacial metal diffusion and mobility degradation", Applied Physics Letters, Vol. 81, No. 16, (14 October 2002), 2956-2958	
		HO, M.-Y., et al., "Suppressed crystallization of Hf-based gate dielectrics by controlled addition of Al ₂ O ₃ using atomic layer deposition", Applied Physics Letters, Vol. 81, No. 22, (November 2002), 4218-4220	
		HUANG, C. H., et al., "La ₂ O ₃ Si _{0.3} Ge _{0.7} p-MOSFETs with high hole mobility and good device characteristics", IEEE Electron Device Letters, 23(12), (December 2002), 710-712	
		IWAI, H., et al., "Advanced gate dielectric materials for sub-100 nm CMOS", International Electron Devices Meeting, 2002. IEDM '02. Digest., (December 8-11, 2002), 625-628	
		JUN, JIN H., et al., "Effect of Structural Properties on Electrical Properties of Lanthanum Oxide Thin Film as a Gate Dielectric", Japanese Journal of Applied Physics, 42, Part 1, No. 6A, (June 15, 2003), 3519-3522	
		JUN, JIN H., et al., "Properties of Lanthanum Aluminate Thin Film Deposited by MOCVD", Electrochemical and Solid-State Letters, 6(11), (2003), F37-F39	
		JUN, JINO, et al., "Study on the precursors for La ₂ O ₃ thin films deposited on silicon substrate", Journal of Materials Science Letters 21, (2002), 1847-1849	
		KIM, C. T., "Application of Al ₂ O ₃ Grown by Atomic Layer Deposition to DRAM and FeRAM", 12th International Symposium in Integrated Ferroelectrics, (March, 2000), pg. 316	
		KIM, Y., "Substrate dependence on the optical properties of Al ₂ O ₃ films grown by atomic layer deposition", Applied Physics Letters, Vol. 71, No. 25, (December 22, 1997), 3604-3606	
		KO, MYOUNG-GYUN, et al., "High density plasma enhanced atomic layer deposition of lanthanum oxide for high-k gate oxide material", 207th Meeting of the Electrochemical Society, (May 2005), 1 page	
		KWON, OH-KYUM, et al., "Plasma-Enhanced Atomic Layer Deposition of Ruthenium Thin Films", Electrochemical and Solid-State Letters, 7(4), (2004), C46-C48	

EXAMINER

DATE CONSIDERED

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		LEE, BYOUNG H., et al., "Thermal stability and electrical characteristics of ultrathin hafnium oxide gate dielectric reoxidized with rapid thermal annealing", Applied Physics Letters, 76(14), (April 3, 2000), 1926-1928	
		LI, AI-DONG, "Characteristics of LaAlO ₃ gate dielectrics on Si grown by metalorganic chemical vapor deposition", Applied Physics Letters, Vol. 83, No. 17, (27 October 2003), 3540-3542	
		LU, X. B., et al., "Investigation of high-quality ultra-thin LaAlO ₃ films as high-k gate dielectrics", Journal of Physics D: Applied Physics, 36, (December 7, 2003), 3047-3050	
		MICHAELSON, HERBERT B., "The work function of the elements and its periodicity", Journal of Applied Physics, 48(11), (November 1977), 4729-4733	
		MIN, YO-SEP, et al., "Ruthenium Oxide Nanotube Arrays Fabricated by Atomic Layer Deposition Using a Carbon Nanotube Template", Advanced Materials, 15(12), (June 17, 2003), 1019-1022	
		PAIVASAARI, JANI, et al., "A comparative study on lanthanide oxide thin films grown by atomic layer deposition", Thin Solid Films, 472(1-2), First available online in 2004, (13 August 2004), 275-281	
		PARK, DAE-GYU, et al., "Characteristics of Al ₂ O ₃ Gate Dielectrics Prepared by Atomic Layer Deposition for Giga Scale CMOS DRAM Devices", 2000 Symposium on VLSI Technology Digest of Technical Papers, (2000), 46-47	
		ROY, P. K., et al., "Stacked high-E gate dielectric for gigascale integration of metal-oxide-semiconductor technologies", Applied Physics Letters, Vol. 72, No. 22, (June 1998), 2835-2837	
		SHIMIZU, TAKASHI, et al., "Electrical Properties of Ruthenium/Metalorganic Chemical Vapor Deposited La-Oxide/Si Field Effect Transistors", Jpn. J. Appl. Phys., Vol. 42, Part 2, No. 11A, (2003), L1315-L1317	
		VAN DOVER, R. B., "Amorphous lanthanide-doped TiOx dielectric films", Applied Physics Letters, 74(20), (May 17, 1999), 3041-3043	
		YAMADA, HIROTOSHI, et al., "MOCVD of High-Dielectric-Constant Lanthanum Oxide Thin Films", Journal of The Electrochemical Society, 150(8), (August 2003), G429-G435	
		YAN, L., "High quality, high-k gate dielectric: amorphous LaAlO ₃ thin films grown on Si(100) without Si interfacial layer", Appl. Phys. A 77, (2003), 721-724	
		ZHONG, HUICAI, et al., "Electrical Properties of Ru and RuO ₂ Gate Electrodes for Si-PMOSFET with ZrO ₂ and Zr-Silicate Dielectrics", Journal of Electronic Materials, 30(12), (December 2001), 1493-1498	

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